

WHAT IS CLAIMED IS:

1. A fuel assembly comprising:

a bottom nozzle set on a lower core plate of
a nuclear reactor;

5 a top nozzle with a hold down spring to urge said
bottom nozzle against the lower core plate;

a plurality of control rod guide tubes which guide
control rods, having passed through said top nozzle,
toward the lower core plate;

10 a plurality of grids mounted on said control rod
guide tubes;

a plurality of fuel rods held by said grids to be
substantially parallel to said control rod guide tubes;

15 a thin tube-like dashpot formed on each of said
control rod guide tubes to reduce a fall velocity of
a corresponding one of the control rods;

a thimble screw which connects each of said
control rod guide tubes to said bottom nozzle; and

20 a drain hole formed to extend through said thimble
screw, wherein

said dashpot has a large-diameter portion, at
a lower portion thereof, with substantially the same
diameter as that of each of said control rod guide
tubes, and a diameter d of said drain hole falls within
25 a range of $0.04D < d < 0.08D$ where D is an inner
diameter of the large-diameter portion.

2. A fuel assembly to be applied to a nuclear

reactor, comprising

a thimble screw which is disposed in a bottom nozzle so as to extend from a bottom surface side, has a drain hole extending through in a longitudinal direction from a spot facing hole of a seat to a distal end, is configured such that a coolant is supplied into the drain hole from the spot facing hole toward the distal end while the nuclear reactor operates and into the drain hole from a distal end side toward the spot facing hole during a scram mode, is locked to the bottom nozzle at the seat with a rotation preventive pin, and is provided with a coolant collision portion, at a drain hole side of the rotation preventive pin, against which the coolant flowing from the distal end side toward the spot facing hole collides in order to increase the pressure drop of the coolant during the scram mode.

3. A fuel assembly according to claim 2, wherein a collision surface of the coolant collision portion against which the coolant collides forms a recessed surface ground in a V-shape from the distal end side toward the spot facing hole.

4. A fuel assembly according to claim 2, wherein a collision surface of the coolant collision portion against which the coolant collides forms a flat surface.

5. A fuel assembly according to claim 2, wherein

a collision surface of the coolant collision portion against which the coolant collides forms a recessed surface arcuately ground from the distal end side toward the spot facing hole.

5 6. A fuel assembly to be applied to a nuclear reactor, comprising

 a thimble screw which is disposed in a bottom nozzle to extend from a bottom surface side, has a first drain hole and second drain hole extending
10 through in a longitudinal direction from a spot facing hole of a seat to a distal end, is configured such that a coolant is supplied into the first drain hole and second drain hole from the spot facing hole toward a distal end side while the nuclear reactor operates and
15 into the second drain hole and first drain hole from the distal end side toward the spot facing hole during a scram mode, and is locked to the bottom nozzle at the seat with a rotation preventive pin, the first drain hole having an opening area smaller than an opening
20 area of the spot facing hole and smaller than an opening area of the second drain hole at the distal end.

 7. A fuel assembly according to claim 6, wherein the thimble screw comprises a coolant collision
25 portion, at a first drain hole side of the rotation preventive pin, against which the coolant flowing from the distal end side toward the spot facing hole

collides in order to increase pressure drop of the coolant during the scram mode.

8. A fuel assembly according to claim 7, wherein a collision surface of the coolant collision portion
5 against which the coolant collides forms a recessed surface ground in a V-shape from the distal end side toward the spot facing hole.

9. A fuel assembly according to claim 7, wherein a collision surface of the coolant collision portion
10 against which the coolant collides forms a flat surface.

10. A fuel assembly according to claim 7, wherein a collision surface of the coolant collision portion
15 against which the coolant collides forms a recessed surface arcuately ground from the distal end side toward the spot facing hole.

11. A thimble screw providing a drain hole formed to extend through for connecting a control rod guide tube of a fuel assembly to a bottom nozzle, the fuel
20 assembly comprising a bottom nozzle set on a lower core plate of a nuclear reactor, a top nozzle with a hold down spring to urge the bottom nozzle against the lower core plate, a plurality of control rod guide tubes which guide control rods, having passed through the
25 top nozzle, toward the lower core plate, a plurality of grids mounted on the control rod guide tubes, a plurality of fuel rods held by the grids to be

substantially parallel to the control rod guide tubes,
and a thin tube-like dashpot formed on each of the
control rod guide tubes to reduce a fall velocity of
a corresponding one of the control rods, wherein

5 an inner diameter D , with substantially the same
diameter as that of each of the control rod guide
tubes, of a large-diameter portion at a lower portion
of the dashpot, and a diameter d of the drain hole
satisfy the following equation $0.04D < d < 0.08D$.

10 12. A thimble screw which is disposed in a bottom
nozzle so as to extend from a bottom surface side,
has a drain hole extending through in a longitudinal
direction from a spot facing hole of a seat to a distal
end, is configured such that a coolant is supplied into
15 the drain hole from the spot facing hole toward the
distal end while the nuclear reactor operates and into
the drain hole from a distal end side toward the spot
facing hole during a scram mode, is locked to the
bottom nozzle at the seat with a rotation preventive
20 pin, and is provided with a coolant collision portion,
at a drain hole side of the rotation preventive pin,
against which the coolant flowing from the distal end
side toward the spot facing hole collides in order to
increase pressure drop of the coolant during the scram
25 mode.

13. A thimble screw according to claim 12, wherein
a collision surface of the coolant collision portion

against which the coolant collides forms a recessed surface ground in a V-shape from the distal end side toward the spot facing hole.

14. A thimble screw according to claim 12, wherein
5 a collision surface of the coolant collision portion against which the coolant collides forms a flat surface.

15. A thimble screw according to claim 12, wherein
10 a collision surface of the coolant collision portion against which the coolant collides forms a recessed surface arcuately ground from the distal end side toward the spot facing hole.

16. A thimble screw which is disposed in a bottom nozzle of a fuel assembly of a nuclear reactor so as to
15 extend from a bottom surface side, has a first drain hole and second drain hole extending through in a longitudinal direction from a spot facing hole of a seat to a distal end, is configured such that a coolant is supplied into the first drain hole and second drain
20 hole from the spot facing hole toward a distal end side while the nuclear reactor operates and into the second drain hole and first drain hole from the distal end side toward the spot facing hole during a scram mode, and is locked to the bottom nozzle at the seat with
25 a rotation preventive pin, the first drain hole having an opening area smaller than an opening area of the spot facing hole and smaller than an opening area of

the second drain hole at the distal end.

17. A thimble screw according to claim 16, having
a coolant collision portion, at a first drain hole
side of the rotation preventive pin, against which the
5 coolant flowing from the distal end side toward the
spot facing hole collides in order to increase pressure
drop of the coolant during the scram mode.

18. A thimble screw according to claim 17, wherein
a collision surface of the coolant collision portion
10 against which the coolant collides forms a recessed
surface ground in a V-shape from the distal end side
toward the spot facing hole.

19. A thimble screw according to claim 17, wherein
a collision surface of the coolant collision portion
15 against which the coolant collides forms a flat
surface.

20. A thimble screw according to claim 17, wherein
a collision surface of the coolant collision portion
against which the coolant collides forms a recessed
20 surface arcuately ground from the distal end side
toward the spot facing hole.